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U. S. Department of Agriculture

THE AGRICULTURAL STUDENT



HORSES AT AGRICULTURAL COLLEGES—A
LETTER

JAS. HOPE

REPLY TO MR. HOPE'S LETTER—PROF. C. S. PLUMB

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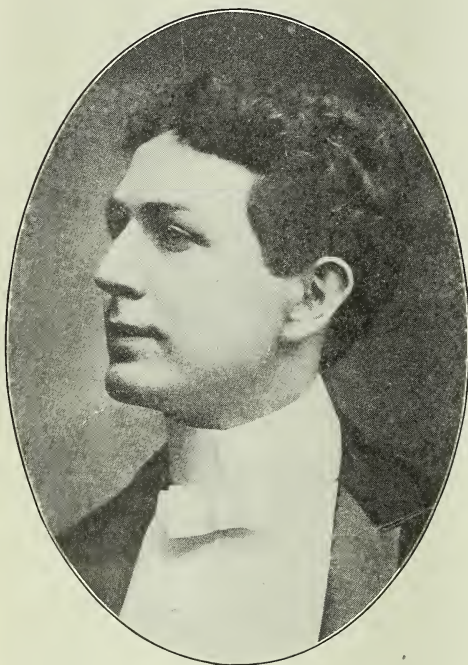
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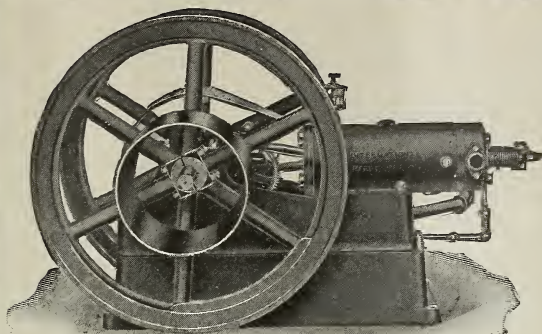
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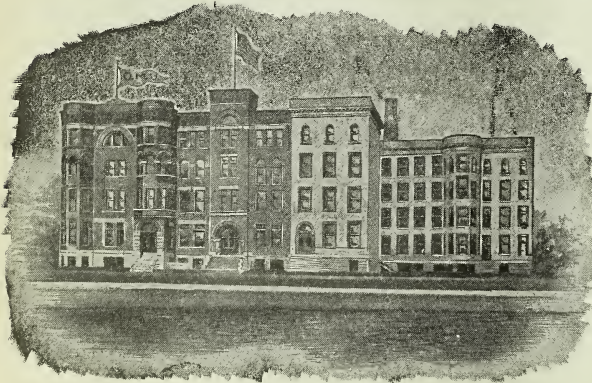
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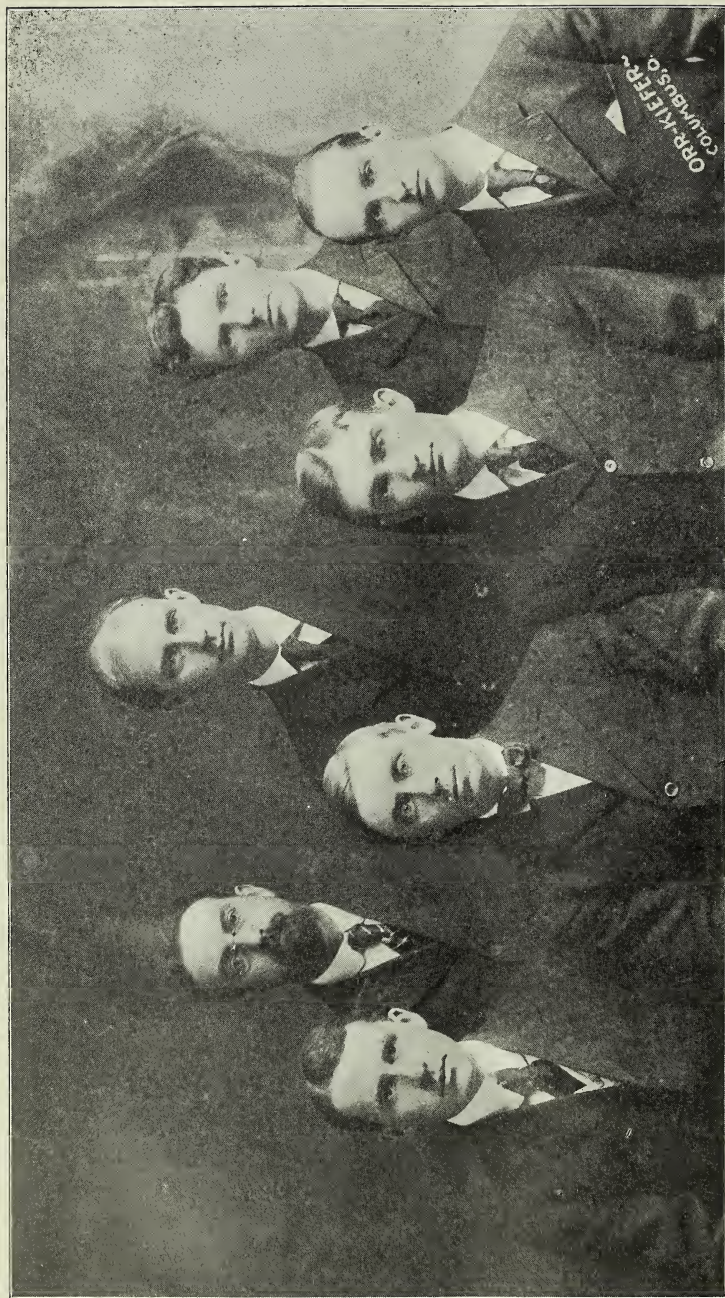
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EDITORIAL NOTES

We are again reminded that another year of college work is at an end and with its completion the College of Agriculture presents for graduation about twenty-four students. As usual the most familiar faces are the ones to leave us, having reached the goal which has been sought so diligently for the past four years. Needless to say that not one of them will ever regret that these years have been so spent, for we sincerely believe that success in the world lies much nearer the pathway of each as a reward for his persistent efforts in attaining an education at this great university. The class leaves us with the best wishes of THE STUDENT.

It is interesting to observe the close friendship which almost invariably prevails among seniors, due in great part to the fact that the "ups and downs" of college life have been experienced by them as a family, so to speak. The acme of acquaintance in college is here reached and ties of endearing friendship are made never to be broken. Friendships of this nature are only developed by congenial associations as classmates

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from term to term. However, "ties that bind" need not be confined necessarily to a class, a society, or a fraternity. The spirit of good will no doubt prevails among our students, but let us hope to have even a more intimate acquaintance between the classes; know one another, and the "weal or woe" of each of us will be received by all alike. When the spirit of friendship and good will prevails so many things can be accomplished by us as a student body; our organizations under concerted action know nothing but success; college spirit and loyalty reaches its zenith in an atmosphere of this kind, and in years to come the student so fortunate to enjoy it will recall "with deep affection and fond recollection" his old Alma Mater and its associations.

The Columbus Work Horse Parade promises to be a great success. Horse owners and drivers have displayed an enthusiasm over the project, which is very gratifying to the promoters. All the best horses in Columbus will be on display, and the spectators will get an opportunity to see what Columbus has in the way of good work horses. Such a show as this should be attended by every horse breeder within one hundred miles of Columbus. It will give him an excellent idea of the market demands for horses and inspire him to produce a better class of stock. If the show is the success it promises to be there is no doubt that it will become an annual feature in Columbus in the future.

Fifty Years Old

This month marks the Semi-Centennial Anniversary of the founding of the first Agricultural College in America. The date should be held almost sacred by the farmers of the country. As the Emancipation Proclamation brought

freedom to the American negro, so has the Agricultural College brought freedom to the American farmer,—freedom from the slavery of ignorance and superstition.

The Agricultural College has had her faults. But whatever they may have been, she is largely responsible for the recent wonderful progress in American farming methods, and the mighty uplift of her agricultural citizenship.

Her graduates are big, broad-minded men, men who are listened to with as much respect in legislative halls as in the farmers' institute. They are revolutionizing the world's oldest industry. They are raising farming from a life of drudgery to the dignity of a profession. —American Farm Library.

A Letter and an Answer

Mr. James Hope, a prominent horseman of Dupage county, Ill., has written an interesting letter to THE STUDENT, entitled, "Horses at Agricultural Colleges." Mr Hope argues for future improvements of horses in this country, and thinks that much of the encouragement and instruction must come from the agricultural colleges. He presents some extremely good suggestions in regard to the work and ends by requesting a reply to his letter by Prof. Plumb through THE STUDENT. Prof. Plumb has consented to do this and we have the pleasure of giving both Mr. Hope's letter and Prof. Plumb's reply.

HORSES AT AGRICULTURAL COLLEGES.

EDITOR AGRICULTURAL STUDENT.—It has always appeared strange to me that the agricultural colleges have done so much in the way of teaching about cattle and sheep and yet have done so little with the horse. Just at present the breeding of draft horses is the most profitable

branch of live stock husbandry on the American farm, yet few of the colleges are doing anything to show the farmer the way he should go to achieve the best results. In figuring over this matter I have come to the conclusion that there are two main reasons why this condition should obtain; first, the general dreath of men well versed in horse matters and competent to teach and second, the high price of the material to use as object lessons. The cogency of either or both may be urged in defence of what seems to me to be a sad omission.

On the other hand when we view abroad the great results which have invariably followed the aiding of horse breeders by a government, we cannot pass up the fact that in this particular we are not only behind the older nations but falling farther to the rear of the procession year by year. In a discussion of this matter it is the custom of those who like to howl about paternalism and that sort of thing to point to the American trotting horse and say that he is the "king amang them a'" and more to that effect, which is true and it is freely admitted that American breeders have evolved without government aid a breed of trotting and pacing horses with a more or less—chiefly leess—fixed type that has no rival in point of harness speed. But there our achievements end. History tells us that we need to import thoroughbred stallions from England to beget the highest class of runners. Sysonby, to my mind the greatest of all the great colts we have ever had on the American turf, was an English-bred colt, imported in dam. Imp. Meddler and imp. Ben Strome have been our leading sires of later years. It is needless to multiply examples. We got the imported thoroughbred horse Messenger

from England about the beginning of the nineteenth century and we built the trotter on the foundation laid by him, but we have not been able to keep the thoroughbred up to the foreign standard.

Similarly we have not been able to keep our drafters as good as the imported stock brought to our shores. Take the imported animals out of the ring at most of our fairs and shows and what would we have left? How many men who buy imported pure-bred stock breed anything from it as good as the parents? How often do you see a farmer buy a pair of pure-bred mares—and pay well for them too—yet in a few years these same mares are hardly fit to be seen—poor, ragged and not at all like what they were? This sort of thing is far too common and it goes without saying that the colts such men raise are half-starved palsied things that never amount to much.

Our general government has started a horse breeding experiment in Colorado and in New England, but these are such feeble growths that not much is to be expected from them and little more from our national congress. Hence is it not up to the states to do through the agricultural colleges some of this work of setting a good example and by practice and precept showing the man who would learn the path along which he may walk to success? Ohio annually turns out most of the great prize winning percherons and French coachers. Perhaps a larger number of first class draft geldings are bred in that state than in any other. If the Buckeye State had never done anything more in the gelding producing line than to evolve old Jim, Armour & Company's champion grade percheron, now in England, she would be entitled to undying fame. Jim was no

accident. The materials from which he was produced are still in Ohio. Would it not be a great work for the Ohio Agricultural College to show how more such drafters can be produced? McLaughlin Bros., who have owned the percheron champions for these several years past, could, I am sure, be counted for aid. Other importers could be similarly enlisted to help in other states.

If I have a misconception of the facts in this case, I would be very glad to have you tell me through your journal where I have gone astray.

Then there is the question of increasing the reproductive effectiveness of a stallion by the aid of the operation of so-called artificial impregnation by syringe or capsule. Surely that is a subject fully worthy of the attention of the colleges in the middle west. Suppose for example, that the get of Etradegant, the champion percheron of 1906, owned by the firm named, should be doubled each season by such aid. Would not that mean much to the horse breeders of a state?

JAS. HOPE.

Dupage county, Illinois.

EDITOR.—Having much respect for Prof. Plumb's grasp of agricultural college matters generally, I would be glad to read his views in the nature of some sort of a brief reply to the suggestions herein contained. I know that many others would also be glad to read them. Glen Ellyn., April 20, 1907. J. H.

PROF. PLUMB'S REPLY.

Various circumstances are responsible for the lack of educational facilities on the horse. Indifference of the people, of the state and of the trustees, lack of trained teachers and lack of money are the main factors. Our colleges have gradually grown into their present estates. In the process animal husbandry

teachers have been turned out in slow degree. The colleges have always been short for money, good horses have been expensive, consequently teaching facilities have been poor in that direction. The colleges of this country have done but little to stimulate the horse lover. If one looks about over the country for instructors who really know horses, their care, management and training, he will find it extremely difficult to locate more than he can count up on the fingers of one hand. How could one expect it otherwise? The educational opportunity has not been at hand, either in teacher or equipment.

The Ohio State University for the past two years has been making an earnest effort to develop educational work with horses. Several motives have inspired this. Ohio is a great horse producing state, rich in equine wealth. Her young men are entitled to unsurpassed facilities in this direction. Some of the most devoted friends of the University are prominent horsemen, and they encourage and help us in the work. What ever the university does to promote our horse interests, is well directed energy and will tend to add to our state prestige. Further, the State University is located in a field rich in material for teaching many phases of instruction with horses. Does another agricultural college have such an opportunity?

But one cannot accomplish great results without unremitting persistence. Given the man, made of the right metal and he will make the opportunity. He will convince trustees, secure the co-operation of citizens and legislators, will obtain money, horses, barns, students and results. It all hinges on the man. If he does not love animals and horses in particular, if he will never make himself



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famous as an educator of ambitious young horsemen.

Ohio is building a beautiful new horse barn, which when finished should be the most complete, substantial and attractive yet to be found on a college farm on this or any other continent. We are ready to place within it over a score of horses, among which are choice and expensive specimens of types and breeds. The university is fortunate in having a teacher in charge of the horse work, who knows his subject and inspires his students. If I can see into the future, the Ohio State University will some day, in the not far distant future, demonstrate that at least Ohio is providing the opportunity for her young men to secure a comprehensive and worthy education in those things which pertain to the horse and his work. Her graduates will go out over the state to further uplift a great industry, or will inspire young men in other schools and colleges, to direct or help conduct experiments elsewhere in breeding, feeding and developing the horse to higher levels. We cannot do very much profound work of improvement on the horse, until we have at least one generation of horsemen, trained under different facilities from what our colleges have heretofore provided.

Further and finally, inasmuch as horses require most intelligent care and attention if they are to prosper, no college will be justified in investing much in horse flesh for educational work, until the institution is ready to pay the price necessary for trained, competent men, who will take such care as will render reasonably satisfactory results, and reflect credit on college and state.

C. S. PLUMB.

Some Agricultural Limitations in Southeastern Ohio

By J. A. BOWNOCKER.

The agricultural possibilities of a country are limited by the soil, topography, market and transportation facilities.

In southeastern Ohio these factors may be classed as follows:

Favorable—Climate; proximity to market.

Unfavorable—Soil: topography; transportation facilities.

FAVORABLE CONDITIONS.

Little needs be said of the climate, since that is similar to the rest of the state. The precipitation ranges from 35 to 40 inches, a fairly generous quantity, while other conditions such as temperature and winds are still more favorable.

The importance of a nearby market is apparent, and southeastern Ohio has this. Among the larger shipping points within striking distance may be mentioned Pittsburg, Wheeling, Columbus, Zanesville, Parkersburg and Marietta. However, large markets nearby are of little value unless means exist for getting the products to these markets, and here is one of the unfavorable conditions in southeastern Ohio.

UNFAVORABLE CONDITIONS.

Soils.—The soils of southeastern Ohio—excepting those in the valleys which are usually of small area—are residual. The rocks from which these soils were formed were chiefly sandstones, sandy shales, conglomerates and limestones. All these rocks except the limestones yield a poor soil. Fortunately the limestone is often widely distributed, thus improving the quality of the soil over large areas.

With two notable exceptions, the Ohio and Muskingum, the valleys are narrow. Further the soils in the valleys, having

been derived from neighboring hills, partake of the character of the hill soils, though of course superior to them. However, because of their small area the valley soils cannot be regarded as increasing notably the value of southeastern Ohio.

The quality of the soil is naturally reflected on the nature and size of the crops. It does not yield favorable results with corn, and the same is true of wheat, potatoes and hay. Formerly the district was a large producer of tobacco, and the old drying houses still stand as monuments to that industry. Now tobacco growing is practically restricted to the eastern part of Noble, the southern half of Belmont and the northern half of Monroe counties. Apparently the southeastern part of our state has passed its zenith in all these crops.

Formerly parts at least of this territory supported large herds of sheep, but this industry has decreased notably in the last decade. Here, however, there is promise in the future.

Topography.—This is easily described. In places it is sharply rolling, but often it is rugged. This condition frequently prevents the use of modern implements. In fact, the silgle shovel plow, the scythe and cradle hold sway here much as they did in other parts of the state 60 years ago.

Topography, however, works in still another way to the detriment of this territory, viz. the washing of the land. Doubtless the present infertility is due in large part to surface wash, and since

this condition cannot be remedied, it must operate to the permanent detriment of the district. As all know the wash is not evenly distributed, but acts most rapidly in places producing gulleys, or even small gorges. This condition will probably become marked in the future and thus further limit the agricultural possibilities of the territory.

Transportation.—Turn to a map of Ohio, preferably one issued by the State Railroad Commissioner, and note the transportation facilities which southeastern Ohio now possesses. The Ohio river skirts the southern edge and the Muskingum flows through the territory. During a large part of the year these streams furnish an outlet for the farmers, but the method is slow and uncertain. Railroads are plainly "few and far between." Traction lines are wanting.

The situation is little better with public roads. If the writer remembers correctly no piking at all has been done in several counties. This condition with the roughness of the topography makes travel comparatively difficult at all times and almost impossible during early spring.

No great relief can be expected in transportation in this part of Ohio. Railroad and traction building are always expensive, and doubly so in this region of high hills and crooked narrow valleys. Improved public roads and slack water navigation in the Ohio river will help, but it seems safe to say that southeastern Ohio will be permanently handicapped by poor transportation facilities.

Commercial Apple Growing in Ohio

It is rather a significant fact that while Ohio does not stand foremost in any of the very important industries, its ranks quite high in a number of them. As an apple producing state it ranked third according to the census report of 1900. The total crop of that year in Ohio amounted to 20,617,480 bushels. The three counties leading in production were Wayne, Fairfield and Washington. As there are not many commercial orchards (orchards of five acres and more) in these counties it is evident that the bulk of the crop came from the small farm orchards. The same must be true of the entire total production, for according to a fairly careful study of commercial orchards in the state, there are at the present time about 225. Since the average size of these is about 25 acres there must be between 5000 and 6000 acres devoted to commercial apple growing. Estimating the average yield at 100 bushels per acre we get a total yield from these orchards of 600,000 bushels, a rather insignificant amount as compared with the entire product.

In making a study of the conditions existing in this industry in Ohio, I have succeeded in getting information from 120 different orchards, each of five acres and more in extent. As to the distribution of these, the counties taking the lead are Lawrence, Meigs, Gallia, Clermont and Hamilton. But few have been planted in central and western Ohio. A number are scattered throughout the counties bordering the lake, but by far the majority are found in the southern portion where the land is quite rolling and practically unfit for cultivated crops.

As was said before, the average size of these orchards is about 25 acres but the following figures will give a better

idea as to the number of orchards of various sizes:

Orchards ranging from 5 acres to 10 acres, 25; 10 acres to 15 acres, 20; 15 acres to 20 acres, 14; 20 acres to 25 acres 12; 25 acres to 50 acres 30; 50 acres to 75 acres, 9; 75 acres to 100 acres, 4; 100 acres to 150 acres, 2; 150 acres and over, 1.

As to the time of planting the following data was obtained:

Time of planting.	Number of orchards.	Number of acres.
1870-79	27	388
1880-89	46	678
1890-99	72	978
1900-05	74	905

Thus it will be seen that there has been quite a rapid increase especially within recent years. During the last five years almost as many acres were planted as during the preceeding ten years. The recent plantings have taken place more extensively in the counties of Lawrence, Meigs, Hamilton, Lucas, Columbiana and Clermont.

The question of varieties is one of particular interest to the orchardist, so an endeavor has been made to find out what varieties were most commonly grown in the large orchards, and the number of trees in each variety. As this information, as well as all that is included in this article, was obtained through correspondence a number of those reporting failed to give full data regarding their orchards; this was especially true regarding the number of trees per variety, so that these figures can only give a fairly approximate estimate of the conditions that exist. In the following table will be found the leading varieties planted, the number of orchards in which found and the number of trees per variety as reported:

Variety	No. of orchards	No. of trees
Ben Davis	67	13,600
Rome Beauty	61	23,335
Baldwin	49	4,432
Grimes Golden	39	4,579
Rhode Island Greening	15	450
Smith Cider	14	980
Yellow Transparent..	13	949
Maiden Blush	13	305
Stark	12	412
Northern Spy	11	175
Rambo	11	20
Jonathan	10	285

Others in the list which were mentioned less than ten times and more than five are Wealthy, Belleflower, Wine Sap, Dutchess, York Imperial, Mann, Red Astrachan, Roxbury Russet, Golden Russet and Hubbardston.

It is quite evident that the two most popular apple for commercial purposes are the Ben Davis and Rome Beauty. The former seems to take the lead in the number of orchards in which found, but the latter leads in the number of individual trees.

The varieties which were the first to come into bearing after planting were reported as follows: Yellow Transparent, Dutchess, Wealthy, Rome Beauty, Ben Davis, Strawberry, Maiden Blush, Jonathon, Wagener and Smith Cider.

As to the most profitable varieties there seemed to be quite a diversity of opinion. This is probably due to differences in adaptability of varieties to particular kinds of soil and climate. For instance, those reporting from the northern part of the state gave preference to the Baldwin, while in the southern part the Rome Beauty was the favorite. The following list shows varieties reported as the best and the number of times mentioned:

Rome Beauty, reported 20 times; Ben Davis, reported 17 times; Baldwin, reported 7 times; Grimes Golden, reported 7 times; and Jonathon, reported 3 times.

Others which were mentioned once or twice were Walbridge, Wolf River, Benoni, Rawle's Janet, Rambo, Tulpahocken, Spitzenburgh, Maiden Blush, Smith Cider, Stark, Wagener and Wealthy.

Within recent years there has been much discussion as to the best method of treating the soil in a commercial orchard. There are many strong advocates of the sod-mulch treatment and many who favor clean cultivation. The most common method, however, practiced by the majority of Ohio orchardists is that of a compromise between these two extremes. This consists in cultivating for six or eight years after planting and then allowing the orchard to grow up in grass. Out of the 120 orchards investigated 107 had been treated in this way. Of the remaining 13, only 5 that were of bearing age were being cultivated, and 8 had been planted in sod.

In the use of commercial fertilizers but little has as yet been done. Only 9 orchards have reported using them to any extent. However, the application of barnyard manure seems to be quite general. In many orchards plant food and soil moisture are maintained to some extent by mulching. This had been performed by about one-half the orchards studied, but many of them did so only every three or four years. In many cases mulching consisted only in cutting the grass of the orchard and allowing it to remain as cut or sometimes raking it up under the branches of the tree.

One of the most important operations connected with orcharding is that of spraying. Pages and pages have been written concerning the value of spray-



Photo by Baker

FIRST ANNUAL A



Photo by Baker

FIRST ANNUAL AGRICULTURAL BANQUET

ing yet there are some who seem to fail to realize the importance of such work. About 96 out of the 120 reported that they sprayed their orchards. Out of this number we find that 19 were sprayed once; 19 sprayed twice; 20 sprayed three times; 25 sprayed four times and 6 sprayed five times.

In the materials used there is quite a variety. This of course depends upon the purpose sought for in the spraying. The following list will serve to show the mixtures most generally used throughout the state:

Mixture	No. of orchards
Bordeau	82
Disparene	40
Paris Green	22
Lime sulphur and salt.....	15
Arsenic	10
Arsenic of soda	11
London purple	3
Kerosene emulsion	2

The purpose aimed at in spraying can never be fully realized until the orchardist has a knowledge of the life history of the enemies which he is attempting to destroy. In response to the question as to what was the orchard's worst pest, the following is a list of the insects and diseases reported, and the number of times they were mentioned:

Codlin moth, 58; scab, 17; San Jose scale, 17; canker worm, 14; apple borer, 8; bitter rot, 5.

Others mentioned a less number of times were curculio, tent caterpillar, scurfy scale, and the green aphid. Thus it will be seen that with all of these enemies to combat the successful apple-grower needs somewhat extensive knowledge of entomology as well as of botany.

Now we come to that phase of orcharding which is of the most vital consequence to every person seeking a live-

lihood, the money value of the product. Accurate data as to this could not be obtained as many had failed to keep any records and consequently did not report. But an estimate based upon the yields that were reported, will give us some idea as to the general prices and the average yields received during the last few years. In the following table will be found the average number of bushels per acre, the average price per bushel and the value per acre for the years beginning with 1901, based upon the reports sent in:

Year.	No. of bu. per acre.	Price per bushel.	Value per acre
1901	83 ...	\$ 60 ...	\$49 80
1902	66 ...	61 ...	40 26
1903	101 ...	68 ...	68 68
1904	67 ...	68 ...	38 86
1905	58 ...	80 ...	76 70
1906	104 ...	58 ...	60 32

It will be thus seen that the lowest money value per acre was \$38.68. To obtain this amount from a corn crop with corn at 40 cents per bushel a yield of 97 bushels per acre would be required.

The outlook for commercial orcharding in Ohio seems very promising. The small farm orchards, owing to neglect of care are gradually wasting away. Their products are also becoming more and more inferior in quality so that the supply of good marketable apples from this source is on the decrease. Our population is increasing steadily and quite rapidly, and since it is estimated that the average American eats from two to three bushels of apple each year we can better appreciate what an increase in our population means. The foreign demand for our apples has also made rapid strides within the last few years. The exports of 1904 alone amounted to about 5,000,000 bushels. Then again, within recent

years a great change has taken place in this country in the creation of a greater demand for fresh fruit. People are realizing more and more the value of fruit as a part of their diet. Some one has said that "the great fruit market of the world is the American workingman, and his staple fruit is the apple."

ORMA J. B. SMITH.

Some Notes on Manure Spreaders

It seems that two of the greatest factors concerning the farmer today are the problems of farm help and the conservation of soil fertility. These two problems are very closely related; in fact the maintaining of the soil fertility really depends upon whether or not efficient help can be secured, because it is only by raising stock and producing large quantities of manure that the farmer can conserve his soil fertility and it is only possible to raise this live stock when sufficient and efficient help can be secured.

Human help is difficult to obtain and in the absence of it, the farmer must use all good labor saving devices that are available. Perhaps no more efficient, practical and economical tool can be secured than a manure spreader. In the December, 1906, number of the "Practical Farmer" a series of articles by nineteen farmers, from at least eight different states, relating their experiences with the manure spreader were given and many advantages of the spreader were urged. The following portion of this article is a summary of the principal points of those articles.

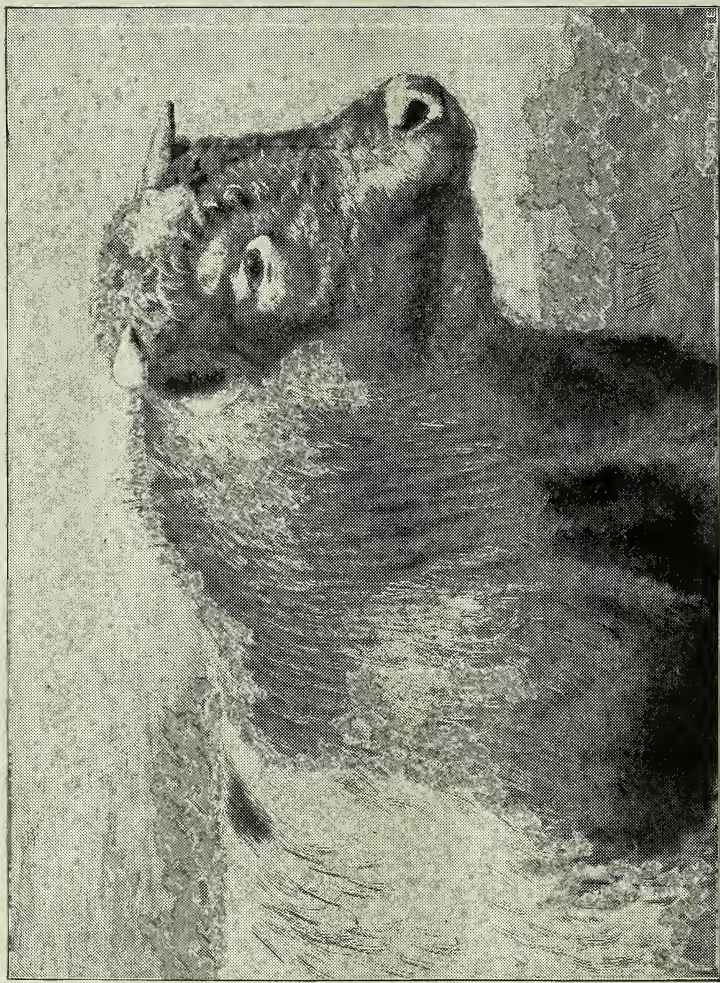
First, in considering their views as to the real value of the machine: These farmers say that it saves much time, as the operator has only to load the machine and the horses do the unloading. This unloading of the spreader can be

done in from three to five minutes while it would take one man with a fork about thirty minutes to scatter the load. Then too, since the operator has only to sit on the seat while unloading, he feels fresher to load up; although it must be admitted that a spreader is more difficult to pitch into than a handy farm wagon.

Mr. Terry states that he can with the spreader dispose of his manure in just one-half the time that he could by the old method. Another farmer writes that one man with a spreader will handle more than twice as much manure as two men would with forks in the same length of time.

Some reader of this may ask, "What is the hired hand to do while the farmer is unloading?" Mr. Terry suggests that the hired man (if any) can very profitably spend that time in loosening up the manure where it is strawy and solid, so it can be loaded much more rapidly and the machine will spread it on the field much better. It is very probable, however, that one man alone can use the spreader to just as good advantage as two men can.

The spreader not only saves time but it also saves manure, i. e. it will put a given amount of manure over a larger area than when it is spread with forks. Practically every farmer in his article made the statement that the manure would cover at least twice as much ground when the spreader was used. This means that the manure is torn up very fine. This fine condition aids greatly the dissemination of the particles through the soil. It can also be mixed with the soil much easier when cultivating the field and then there is a larger amount of surface exposed upon which the nitrifying bacteria may work, so the manure is changed into plant food more quickly, hence a larger crop pro-



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IMP. ROAN LADY

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duced than if double the amount of manure had been applied by hand. Too much coarse manure when plowed under may dry out the soil, as this loose layer is liable to break the capillarity between the soil and subsoil below.

Work done at experiment stations shows that small amounts of manure spread often give better results than larger amounts spread less frequently.

Soil amendments such as floats, lime, etc., can be applied with the spreader by putting them in with alternate layers of manure.

By using the spreader, top dressing of manure can be applied to young clover in fall or wheat in early spring, for it is almost impossible to spread manure thin enough by hand for these crops. If one has teams enough to pull the machine a light dressing can also be applied to ground freshly plowed for corn.

These farmers in speaking of the makes of machines, recommended several kinds, but there seemed to be more "Success" spreaders in use than of any other make. However, there are several special points desired whatever the make of machine. In the first place it seems desirable to have the gearing consist of a worm wheel and worm gear. This is able to keep the apron from moving forward or backward too fast and at the same time gives a steady motion. Then the front wheels should track with the rear ones, so the draft will not be so heavy, also more tracks are made in the field if the wheels do not track. A clog chain which fits over the tire of the gear wheels is desirable to prevent them from slipping if the ground should be thawing slightly at the surface.

Manure spreaders seem to demand better care than most any other farm implement. There is a considerable mechanism concerned in them, hence

many wearing parts which need oil. Therefore the oil can should be carried on the machine and it should be frequently used. Nothing will shorten the life of the machine so much as a lack of oil. If the spreader is allowed to stand out in any rains the metal parts will rust and the bottom will swell so that the draft is greatly increased.

In conclusion, it may be said that the manure spreader saves time, money, labor and manure. Hence the opinions of those farmers were that every farmer who has much manure to get out which he certainly should have, should not be without one of these time-saving, money-making and labor-saving machines—the manure spreader.

ERNEST CLAWSON.

Facts About Wool

THE FIBRE—

Wool is the hair like covering of the sheep, and with hair which has much in common with it in regard to physical and chemical properties, it makes up the great bulk of fibres which possess any considerable technical importance. The fibres of wool appear to exhibit in the highest degree those properties which make the most suitable textile fibre. These properties may be enumerated as being: (a) Sufficient length, strength and elasticity, together with certain surface cohesion, to enable several fibres to be twisted or spun together so as to form a coherent and continuous thread or yarn; (b) The power of absorbing coloring matters from solution and so becoming dyed, and also the property of becoming bleached when treated with certain chemical agents; (c) In addition to these properties wool-fibres have the quality of felting or matting due to the peculiar physical character of their surfaces. This property is a valuable one

as it adapts wool to a large number of uses to which other fibres are unsuitable. The outer layer of a wool fibre is made up of scales which vary in size and shape and in the extent to which they are attached to the body of the fibre. Those which have about one-third of their surface free from the fibre body are most suitable for felting.

CLASSIFICATION—

Wool in general is divided according to quality roughly into nine classes, as follows:

(1) The shoulders and sides give the finest and most even staple of fibre.

(2) The lower part of the back yields a fibre of fairly good staple.

(3) The loin and back give a shorter staple and the fibre is not so strong.

(4) The upper part of the legs give a staple of moderate length. The fibre on this part is frequently in the form of loose open locks and is apt to contain burrs.

(5) The upper part of the neck gives a rather irregular staple which is also frequently filled with burrs.

(6) The center of the back gives a fine delicate staple similar to that of the loins.

(7) The belly and legs give a poor staple and a weak fibre.

(8) The tail gives a short, coarse and lustrous fibre.

(9) The head, chest and shins give a short, stiff and straight fibre, dead white in color.

In length of staple wool fibres are divided into two classes: Tops and noils. Tops are those which are combed and spun into worsted yarns and manufactured into dress goods of all kinds. Noil are short stapled fibres which are carded and spun into woolen yarns and are used in making goods where a felting together of the fibres is desired.

CONDITIONING—

The amount of moisture in wool will vary with atmospheric conditions. Wool brought from California, where the climate is dry, to Massachusetts, will increase in weight by taking on moisture. This has been found to be such an important factor that in England and Europe official laboratories called "conditioning houses" have been established where the actual amounts of fibre and of moisture are determined. A representative sample of wool is taken from the lot to be tested and the per cent. of hygroscopic moisture is determined by drying.

The amount of true fibre is, of course, found at the same time, and to this is added a certain fixed per cent. varying between 16 and 19, in order to determine the amount of normal wool in the sample. This addition is called "regain."

STRENGTH AND ELASTICITY—

The following is the average strength and elasticity of wool fibres and human hair as determined by Bowman.

Wool.	Tensile Strength Gains	Elasticity Per Cent.	Diameter Inches
Human hair	106	36.6	0.00332
Lincoln wool	33	28.4	0.00181
Leicester	31	27.3	0.00164
Southdown wool	5.9	26.8	0.00099
Australian merino	3.2	33.5	0.00052
Saxony merino	2.5	27.5	0.00034

Taking human hair at 100 and comparing these figures of tensile strength for equal cross-sections we have:

Human hair	100.0
Lincoln wool	96.4
Leicester	119.9
Southdown wool	62.3
Australian merino	122.8
Saxony merino	224.6

C. E. SNYDER.

News Notes

Homer C. George and H. C. Green have positions in the soils department of the Ohio Experiment Station.

W. J. Davis will make an extended trip through the west this summer.

L. H. Fox expects to go into the dairy business after his graduation.

S. B. Stowe will have charge of a crew in the forestry survey work of the experiment station. Several of the students will also go out on this work.

John McNutt has charge of the dairy on the Hartman farm near Columbus.

Mr. Guthrie, of the Dairying Department, was called to Coolville, O., Athens county, to help a newly organized co-operative creamery company get started. The creamery was built and furnished by the Hastings Supply Co., of Chicago, Ill. This creamery is located in a locality which has a very poor outlet for its dairy product, which is fortunate for the new company because there will be practically no competition. The output is about three hundred pounds of butter per month.

It is interesting to know that Mr. H. Dutton's father is president of the Coolville Co-operative Creamery Company.

At the May meeting of the Agricultural Society, Mr. Geo. Potts, who has had charge of the McLaughlin horses for years gave a talk on the feed and care of the stallion. No man is better qualified to talk on such a subject than Mr. Potts for his experience and success in this work have been great and have given him a national reputation. Some

of the more important points of his talk are summarized below. Have large roomy stalls with plenty of fresh air and sunlight; sunlight is the best disinfectant. Clay floors are the best for the horse as they do not become excessively hard, and are not slippery. They also keep the horse's feet in better condition. Give plenty of bedding and renew it often. Feed boxes should be large so that the feed may be spread out and the horse must take more time in eating it. Oats is the sfiest grain feed for the stallion and should furnish the bulk of the feed. Sloppy bran should be fed often as it is a good conditioner. Exercise great care in feeding; better to underfeed than overfeed; be regular in feeding; study the horse; do not feed all horses alike; when you get a new horse study him and be careful of feed until he is gotten upon full feed. Always water before feeding. When a horse is in condition cut his feed in half. Give Epsom salts for lumpiness.

Give plenty of exercise at regular intervals and when in the stable encourage lying down by keeping things quiet; a horse which lies down much will condition more quickly. Select the caretakers in reference to their temperament and that of the horse; that is certain men can take care of certain horses better than others and certain horses like a man of a certain disposition. Always be quiet around the stable and do not startle the horse in any way. Be firm; do not pet too much as this spoils any horse. Plenty of brushing keeps the skin in good condition and prevents horses rubbing in the stalls. Keep the horses shod at all times.

Prof. Plumb recently made a trip to Dan Black's farm in Ross county to select some steers for the University.

These steers will soon arrive and be fitted to show at the next International Stock Show at Chicago.

Work on the barns is now well under way, and it is expected that they will be completed by fall. If you want to see Prof. Plumb smile just mention "new barn" to him. In reality the construction of these barns is one of the biggest steps in the improvement of our agricultural school since Townsend hall was built. When completed they will be by all odds the finest agricultural barns in the United States.

Alumni News

Prof. C. W. Burkett, '96, director of the Kansas Agricultural Experiment Station, was here recently. He will make a trip to Europe soon, where he will spend some time in Russia, studying Russian varieties of wheat with reference to their adaptibility to Kansas conditions.

Mr. James D. Love a last winter's dairy student is at Lake Forest, Ill., on a large dairy farm. He reports that they milk nearly one hundred cows, nearly all grade guernseys. The herd is owned by a Mr. Hill.

F. E. Address, '06, was recently in Columbus. He is engaged in farming in Lorain county, and looks as if the work agreed with him.

Robert E. Young, '06, H. and F., has secured a position in the division of plant propagation of the Agricultural Department at Washington, D. C. Mr. Young has gone to assume his new position, and his wife will go to join him sometime in the near future.

R. W. Harned, '06, writes from Mississippi, where he is employed as entomologist in the Experiment Station, that he is much pleased with his work and is enjoying life.

Miss Nola K. Fromme, '05, Domestic Science, goes to Brooking, South Dakota, as instructor in Household Economics the coming year.

Mr. J. H. Fickel, who was a Horticultural student here in 1883-4 is now located at Mountain View, California, where he has a fine fruit farm. He raises prunes, apricots, cherries and peaches. Last year two acres of cherries sold on the tree for \$1600.

C. H. Flory, '05, who spent a year at the Yale Forestry School after graduation, and is now connected with the United States Forest Service, was a visitor at the university for a short time last week. He is stationed at Mt. Ranier National Park, and is thoroughly enjoying his work.

His classmate, R. L. Fromme, who also graduated from the Department of Horticulture and Forestry, is stationed on one of the Natinol Reserves in Idaho.

Rev. W. P. Bentley, '85, who has the distinction of being the first graduate in agriculture from the State University, and who is now a missionary and teacher at Shanghai, China, has published a number of useful volumes in the Chinese language. One of the mose recent of his publications is a plan for a National Department of Agriculture for China.

Rev. Bentley has recently sent a series of his publications to Prof. Lazenby.

Among Farm Papers**BREEDERS' GAZETTE.**

The Breeders Gazette, of May 15, contains a very interesting article by Joseph E. King, entitled "Virgin Soils and Fields Old yet New," in which he speaks of those early days when the farmer needed only to tickle the soil to cause it to bring forth an abundant crop. He states further that this method of continual cropping without returning anything to the soil has continued until it is now a question whether it would be best to stay on the old farm and try to improve it or sell out and go in search of new lands to conquer. Mr. Wing advises the former plan, and shows how, by careful study and management, with a systematic rotation of crops, and by feeding the products on the farm thus returning the fertility to the soil, it is possible to build up these old farms to such an extent that they will not only be as much, but more than they ever did before.

PRACTICAL FARMER.

In the Practical Farmer of May 18, C. Grandpiere gives a vivid picture of European farming. His statements in brief are as follows: The European farmer follows a much more intensive system of cultivation than is used in Amer-

ica. If he were to use our methods of seeding and cultivation, which have proved so successful for us, he would not be able to raise over three bushels of wheat per acre. Wheat is grown there merely as a rotation crop, owing to the fact that America can deliver it to them cheaper than they can produce it at home. The American land is cheap and naturally fertile, while that of Europe has been under cultivation for centuries. And such land as we would sell for from twenty-five to thirty dollars would bring from two to three hundred dollars in Europe. The farms there are of small size, forty acres being considered a good sized farm and one hundred acres an agricultural establishment. The cattle are kept in the stable for almost the entire year and the manure carefully saved and applied to the soil. In fact so rich is their soil that as a rule they are able to produce three crops on the same field in two years and sometimes two crops a year. The silo and other modern soiling methods are used, but their systems have become so intensive that one can prosper without an agricultural education. The American farmer is more prosperous and gets his living easier, but in the future American farming will be more of a profession than it has been in the past.

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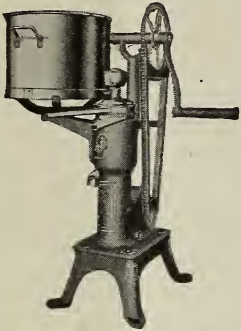
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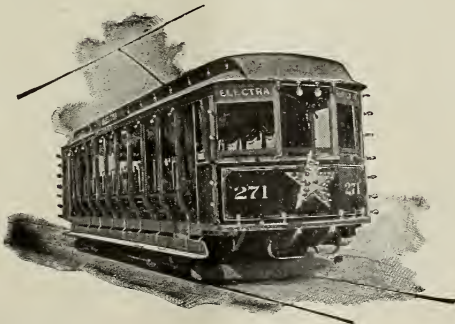
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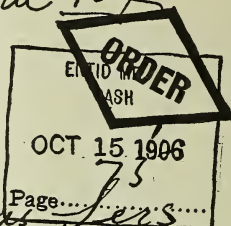


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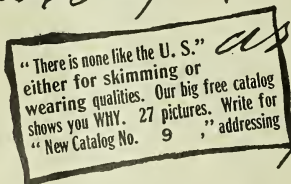
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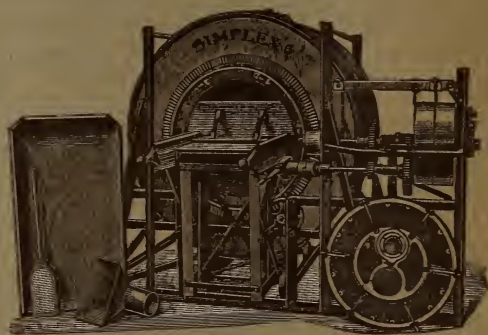
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